

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1-42. (cancelled)

43. (currently amended) A recombinant hemin protein having the capacity to reversibly bind oxygen, comprising at least one iron-containing porphyrin nucleus, of plant origin, and a protein component comprising at least one polypeptide chain, of animal origin.

44. (currently amended) The recombinant protein according to claim 43, wherein the at least one iron-containing porphyrin nucleus is iron-containing protoporphyrin IX, or a protoporphyrin differing from protoporphyrin IX in the nature of the side chains, carried by the β atoms of the pyrrole rings.

45. (currently amended) The recombinant protein according to claim 43, wherein the protein component comprises at least one α and/or β -globin polypeptide chain, or variants thereof of the said polypeptide chain, comprising one or more amino acid substitution(s), deletion(s) or insertion(s), the hemin protein being capable of binding oxygen reversibly.

46. (currently amended) The recombinant protein according to claim 45, wherein the α or β -globin chain, or variants thereof of the said polypeptide chain, comprises in addition a chloroplast targeting signal, a mitochondrial targeting signal, or a N-terminal signal peptide in combination with a signal responsible for retaining a protein in the endoplasmic reticulum or a N-terminal signal peptide in combination with a vacuolar targeting signal.

47. (currently amended) The recombinant protein according to claim 45, wherein each α and/or β -globin polypeptide chain lacks an ~~NH₂-terminal methionine~~ terminal methionine.

48. (currently amended) The recombinant protein according to claim 43, wherein the protein component comprises at least four polypeptide chains of α and/or β -globin or variants thereof of the said polypeptide chain, each said ~~potypeptide~~ polypeptide chain being bound to an iron-containing protoporphyrin nucleus.

49. (currently amended) The recombinant protein according to claim 48, wherein the protein component comprises 2 α -globin chains and 2 β globin chains, or variants thereof of the said polypeptide chain.

50. (currently amended) The recombinant protein according to Claim 43, wherein said protein binds oxygen with an affinity of between 7 and 40 mm Hg.

51. (currently amended) A pharmaceutical product comprising one or more recombinant hemin protein(s) according to Claim 43 in association with a physiologically acceptable excipient.

52. (currently amended) The recombinant hemin protein according to claim 50, for the treatment of conditions requiring an improvement in the transport of oxygen in the blood.